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DEVELOPMENT OF ENVIRONMENTAL SUPPORT ON MINE DETECTION
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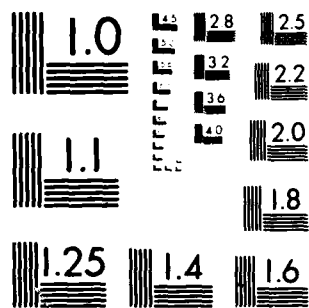
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MICROCOPY RESOLUTION TEST CHART
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Development of Environmental
Support on Mine Detection
Techniques

Second Special Report

by

Peter Jessl

Werner Köppel

August - October 1983

United States Army

EUROPEAN RESEARCH OFFICE OF THE U.S. ARMY

.London England

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Battelle-Institut e.V., Frankfurt/M., West Germany

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Mine detection; terrain analysis; land use; cultivation practices			
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)			
Crop type classification of agricultural areas needs some care to be defined in a meaningful way. A classification term such as "soil cultivation" is inadequate to discriminate between various types of cultivation, such as plow harrowing, chopping with a rotary plow, and shallow plowing. Each results in a widely different set of thermal and reflectance properties.			

Concerning the crop type classification of agricultural areas "soil cultivation" needs some care to be defined in terms of cultivation depth and related farm implements. Cultivated stubble fields which are defined as class 20 in the crop type A class system (class 001 in the crop type B class system, respectively) can be generated in basically 3 ways; the general procedure of cultivation may be defined as "chopping/milling" process. The three procedures are

1) "Plow harrowing":

Hook-shaped fixed lances penetrate into the stubble field soil by approx. 4 - 6" (photos 1, 2, 3, 4, 6, 7, 9, 10, 11, 19) This is the most commonly applied stubble field cultivation procedure.

2) "Chopping" by means of a rotary plow:

Rotating knives intrude the stubble field soil by approximately 3-5" depth (photos 5, 12)

3) "Shallow plowing":

Cutting of the stubble field soil in terms of shallow plowing down to approx. 5" depth (photo 8)

In some cases, farmers are burning down the stubbles before cultivating the soil (photo 1; next to the orchard stubbles were not burnt) Photos 13 and 14 show rape growing on the stubble field being used to build up the "green dung" procedure; here, the soil will be enriched with organics later when the green fodder is plowed into the soil mass.

Photos 15 and 16 indicate turnips and sugar beets; turnips are not row-arranged and grow approximately 90 % above ground surface (see photo 17).

Photographs of some typical German crop types and land-use practices

(20 September 1983)

Photo No.	Crop Type A	Classes of Crop Type B	Crop Height	Crop condit.	Remarks
1	20	001	00	0	Cultivated with a plow harrow; prior to that stubbles were burnt, but not along the left boundary of the field
2	20	001	00	0	stubbles burnt on half of the area; later cultivation with plow harrow
3	03,04	001	00	0	cutlivated field; ready for sowing
4	06 20	007 001	02 00	2 0	cultivated
5	05,20 17	001 003	00 01	0 2	20 - cultivated (chopped with rotary plow)
6	06 10 20	007 001 001	02 02 00	2 2 0	cultivated with plow harrow
7	01/04 /20	001	00	0	plowed/harrowed/cultivated with plow harrow
8	06 20	007 001	01 00	0 0	cultivated by shallow plowing
9	20	001	00	0	cultivated with plow harrow (hard soil surface)
10	20	001	00	0	cultivated with plow harrow
11	20	001	00	0	cultivated with plow harrow
12	20	001	00	0	cultivated with rotary plow
13	15	003	02	1	rape as green dung
14	15	003	01	1	rape as green dung
15	06 08	007 008	02 02	2 2	sugar beets turnips (not row-arranged)
16	06 08	007 008	02 02	2 2	sugar beets turnips (not row-arranged)
17	08	008	02	2	turnips (typical growth)
18	19	002	01	0	stubble field
19	20	001	00	0	partially burnt stubbles, then cultivated with plow harrow



Photo
No. 1



2



3



4



5



6



7



8



9



10



11



12



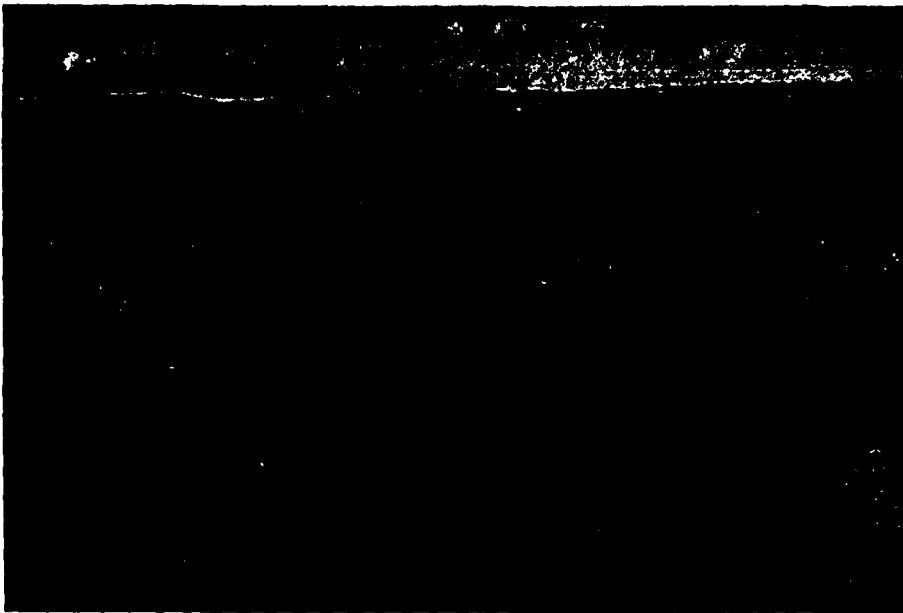
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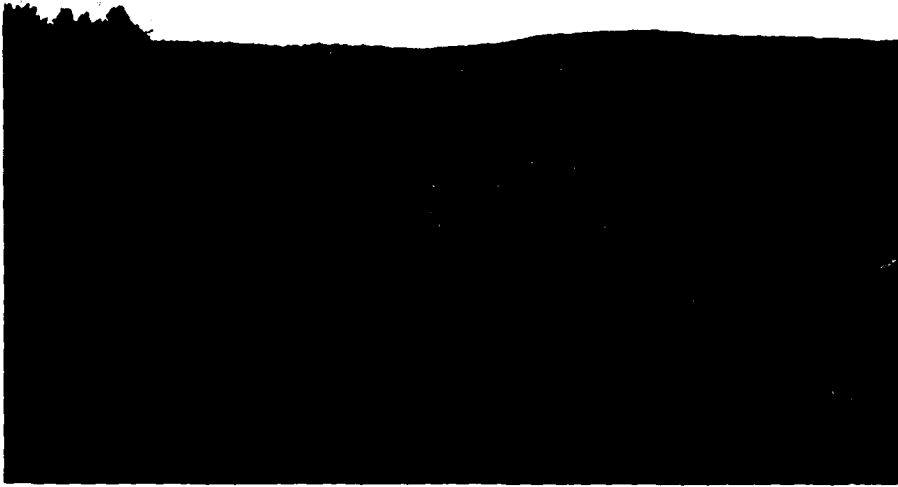
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16



17



18



19

